

WHAT IS CLAIMED IS:

1. An automatic gain controller, comprising:

a first multiplexer for receiving an input signal and a gain and generating a first output;

a second multiplexer for receiving a signal time constant and a gain time constant and generating a second output;

a filter electrically connected to said first multiplexer and said second multiplexer for generating one of a signal-energy and an actual gain in response to said first output and said second output;

a signal-energy processing device electrically connected to said filter, said first multiplexer and said second multiplexer for generating said gain and said gain time constant in response to said signal-energy; and

a multiplier electrically connected to said filter for multiplying said actual gain by said input signal to generate an output signal.

2. The automatic gain controller as claimed in claim 1, wherein said input signal is a volume signal.

3. The automatic gain controller as claimed in claim 1, wherein said first output and said second output are determined by said first multiplexer and said second multiplexer respectively by means of a level variation at an enabling end.

4. The automatic gain controller as claimed in claim 3, wherein said first output and said second output are said input signal and said signal time constant respectively when said enabling end is at a high level.

5. The automatic gain controller as claimed in claim 3, wherein said first output and said second output are said gain and said gain time constant respectively when said enabling end is at a low level.
6. The automatic gain controller as claimed in claim 1 further comprising a flip-flop electrically connected to said multiplier for outputting said output signal according to said level at said enabling end.
7. The automatic gain controller as claimed in claim 6, wherein said flip-flop is a D type flip-flop.
8. The automatic gain controller as claimed in claim 1, wherein said filter is an infinite impulse response filter.
9. The automatic gain controller as claimed in claim 8, wherein said filter comprises two shift registers.
10. The automatic gain controller as claimed in claim 8, wherein said signal-energy is output by said filter when said first output is said input signal and said second output is said signal time constant.
11. The automatic gain controller as claimed in claim 8, wherein said actual gain is output by said filter when said first output is said gain and said second output is said gain time constant.
12. The automatic gain controller as claimed in claim 1, wherein said signal-energy processing device comprises a comparator and a divider.
13. The automatic gain controller as claimed in claim 12, wherein said signal-energy is compared with a predetermined noise level by said signal-energy processing device, a first gain and a first gain time constant are output from said signal-energy processing device if said signal-energy is greater than said noise level and a second gain and a second gain time

constant are output from said signal-energy processing device if said signal-energy is less than or equal to said noise level.

14. An automatic gain controller, comprising:

a first multiplexer for receiving an input signal and a gain and generating a first output;

a second multiplexer for receiving a signal time constant and a gain time constant and generating a second output;

a filter electrically connected to said first multiplexer and said second multiplexer for generating one of a signal-energy and an actual gain in response to said first output and said second output; and

a signal-energy processing device electrically connected to said filter, said first multiplexer and said second multiplexer for generating said gain and said gain time constant in response to said signal-energy.

15. The automatic gain controller as claimed in claim 14 further comprising a multiplier electrically connected to said filter for multiplying said actual gain by said input signal to generate an output signal.

16. The automatic gain controller as claimed in claim 15 further comprising a flip-flop electrically connected to said multiplier for outputting said output signal according to a level at an enabling end.

17. The automatic gain controller as claimed in claim 14, wherein said filter is an infinite impulse response filter.

18. The automatic gain controller as claimed in claim 17, wherein said filter comprises two shift registers.

19. The automatic gain controller as claimed in claim 14, wherein said signal-energy processing device comprises a comparator and a divider.

20. A gain controlling method for processing a signal-energy by means of a signal-energy processing device of an automatic gain controller and generating an actual gain in response to said signal-energy, comprising steps of:

- a) comparing said signal-energy with a predetermined noise level;
- b) generating a first gain and a first time constant by means of said signal-energy processing device if said signal-energy is greater than said noise level;
- c) generating a second gain and a second time constant by means of said signal-energy processing device if said signal-energy is less than or equal to said noise level.

21. The method as claimed in claim 20, wherein said step b) further comprises step b1) processing said first gain by means of a filter for generating said actual gain.

22. The method as claimed in claim 20, wherein said step c) further comprises step c1) processing said second gain by means of a filter for generating said actual gain.

23. The method as claimed in claim 20, wherein said first gain is a ratio of a predetermined assigned level to said signal-energy.

24. The method as claimed in claim 20, wherein said second gain is a predetermined value less than or equal to 1.